

Coccolithophore palaeoproductivity variations related to hydrographic changes from the Last Glacial Maximum to the Holocene in the western South Atlantic Ocean

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The aim of this study was to acquire information about palaeoproductivity records based on coccolithophore assemblages and relate them to the contribution of terrigenous sediments. Sediment core GL-824 was collected from the upper slope of the western South Atlantic Ocean at 532 m water depth. Terrigenous-supply proxies (Fe/Ca and Ti/Ca) were measured by XRF and showed a very similar pattern when compared with the fine-fraction sediments – higher values throughout the Last Glacial Maximum (LGM) and lower values during the Holocene. The dominant species in the coccolithophore assemblages were *Emiliania huxleyi*, *Gephyrocapsa* spp. and *Florisphaera profunda*, with these species together representing between 82 and 99% of the total assemblages. They, along with a few subordinate species, were used for the palaeoproductivity analysis. The N ratio and the estimate of primary production (EPP) exhibited a very similar trend, with higher values of productivity during the LGM. Towards the Late Holocene, the values lowered at ~15 kyr, when the N ratio and the EPP reached their minimum values. Palaeoproductivity was controlled mainly by the position of the main flow of the Brazil Current (BC), which can be linked directly to relative sea level. In periods of high sea level (low Fe/Ca and Ti/Ca), the BC transported the warm and oligotrophic waters to the upper slope, preventing any nutrient arrival from deeper layers or coastal waters. In contrast, during low sea-level periods (high Fe/Ca and Ti/Ca), the offshore displacement of the BC allowed the presence of coastal waters (more nutrient rich than tropical waters) and the erosion of the exposed shelf, which provided more nutrients to the photic zone, thus enhancing primary productivity.